Remarks

The Office Action dated December 11, 2009, has been received and carefully reviewed. The preceding amendments and the following remarks form a full and complete response thereto. Claims 1-6 are pending in the present application. Claims 4 and 6 have been withdrawn from further consideration. Claims 1-3 have been amended as to matters of form only. No new matter has been added. Accordingly, claims 1-3 and 5 are pending in the application and submitted for reconsideration.

Objection to the Drawings

Objection was made to the drawings under 37 C.F.R. § 1.83(a) for allegedly not showing every feature of the invention specified in the claims. The Office asserted that "the internal surface coverage by fibers being 2-20 percent must be shown or the feature(s) cancelled from the claim(s)." Office Action at p. 3. Applicants respectfully traverse the objection.

Figs. 1-3 expressly show fiber layer 30 and internal surface 12, which fully facilitates understanding of the claimed subject matter. An objection based on 37 C.F.R. § 1.83(a) requires an applicant "to furnish a drawing of his or her invention where necessary for the understanding of the subject matter sought to be patented." 37 C.F.R. § 1.83(a). *See also* 35 U.S.C. § 113 (requiring an applicant to "furnish a drawing where necessary for the understanding of the subject matter to be patented"). Here, Applicants have provided drawings showing both internal surface 12 and fiber layer 30. Nothing further is necessary for an understanding of the fibers of the claimed fiber layer being substantially uniformly distributed over the internal surface providing a surface coverage of 2 to 20 percent. Accordingly, the objection to the drawings is improper, and reconsideration and withdrawal are respectfully requested.

Rejection of Claims under 35 U.S.C. § 103

Claims 1-3 and 5 were rejected under 35 U.S.C. § 103(a) as being as being unpatentable by reason of obviousness over European Publication EP1208962B1 to Weibel ("Weibel") in view of European Publication EP0162645A1 to Harada ("Harada"). Claims 1-3 and 5 were also rejected over the U.S. Patent Application Pub. No. 2003/0234058 to Tippins ("Tippins") in view of U.S. Patent No. 4,192,352 to Hakamada et al. ("Hakamada"). Claims 1-3 and 5 were additionally rejected over Tippins in view of Harada. MPEP 706(I). Applicants respectfully traverse these rejections and submit that the claims are patentable for the following reasons.

Regarding claim 1, upon which claims 2, 3 and 5 depend, it is drawn to a polymeric foam tube for pipe insulations. The tube includes an external surface and an internal surface. The internal surface is provided with an adhesively bonded additional layer that is a layer of fibers which (1) comprise a material having a melt temperature that is higher than that of the polymeric foam, **(2) are adhesively bonded to the internal surface such as to stand up from the internal surface, and (3) are substantially uniformly distributed over the internal surface providing a surface coverage of 2 to 20 percent, and the fibers have a linear density of 0.5 to 25 dtex and a length of 0.2 to 5 mm.**

The cited references do not disclose or suggest a layer of fibers which are substantially uniformly distributed over the internal surface providing a surface coverage of 2 to 20 percent, and have a linear density of 0.5 to 25 dtex and a length of 0.2 to 5 mm, as required by claim 1. It was admitted in the Office Action that each primary reference fails to disclose "the percent coverage and density of the fibers." Office Action at pp. 4-6. Nonetheless, it was alleged that:

> it is considered merely a choice of mechanical expedients where one skilled in the art would have found it obvious to use **routine experimentation** to establish to establish the proper coverage and density of fibers required to meet the needs of the user as such would only require routine skill in the art as it is an obvious

> choice of mechanical expedients and where using fewer fibers would save in costs.

Id. (emphasis added).

However, this assertion is incorrect. It is improper to characterize the claimed ranges as achievable through routine experimentation because (1) the claimed fiber distribution/surface coverage and fiber linear density are not recognized as result-effective variables, and (2) the claimed ranges are critical.

"A particular parameter must first be recognized as a **result-effective variable**, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." MPEP 2144.05(II)(B) (emphasis added) (citing *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)). Here, the rejections, which are based on routine experimentation, are improper because the cited references do not recognize fiber distribution/surface coverage and fiber linear density as result-effective variables.

In addition, the rejections are improper because the particular claimed ranges are **critical**. *See* MPEP 2144.05(II)(C) (citing *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)). Here, the claimed fiber distribution/surface coverage, fiber linear density and fiber length are critical because, "by preparing the additional layer with careful selection of fiber diameter and length, the product may be used also for various sizes of pipes because compressibility of the inner layer." Specification at ¶ 0016. Further, the claimed fiber distribution/surface coverage and fiber linear density are critical because, "[a]s the surface of the tube is only partially covered with fibers, the inner layer is mostly air," which has a low thermal conductivity. Specification at ¶ 0018.

Thus, the rejections of claims 1-3 and 5 are improper. Accordingly, Applicants request that the rejections be withdrawn.

Moreover, the rejections of claims 1-3 and 5 are improper for the separate and independent reason that the cited references do not disclose or suggest fibers that "are adhesively bonded to the internal surface [**of a tube**] such as to **stand up from the internal surface**," as required by amended claim 1. (emphasis added).

Rejection over Weibel and Harada

Weibel and Harada, taken alone or in combination, do not disclose fibers that "are adhesively bonded to the internal surface [of a tube] such as to stand up from the internal surface," as required by amended claim 1. Weibel discloses that the fibers are contained in the sliding film or mixed into the sliding material for extrusion and have reinforcement purposes. Weibel at Abstract; Applicants' Specification at ¶ 0004. It was admitted in the Office Action that Weibel does not disclose that "an adhesive layer holds the fibers such that they stand up from the [internal] surface [of hose 11]." Office Action at p. 4. Harada discloses forming "a mass of densely standing fine carbon fibers on [a] base material" that acts as a heat insulator for the base. Harada at Abstract. The Office alleged that:

> It would have been obvious to one skilled in the art to modify the fiber layer in Weibel by providing an adhesive layer to hold the fibers such that they stand up from the surface as suggested by Harada where such is a **known equivalent** way to attach fibers to a base structure for insulative purpose where such would also inherently provide **better** sliding quality as well if the fibers were on end and the adhesive would prevent premature loss of fibers requiring repair and thereby saving costs.

Office Action at p. 4.

"In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or

the mere fact that the components at issue are functional or mechanical equivalents." MPEP 2144.06(II) (citing *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958)). Here, there is no recognition in the prior art of the equivalence of fibers in a reinforcing/sliding material and a mass of densely standing fine carbon fibers. In fact, components at issue are not even disclosed as having the same function because the fibers of Weibel have a sliding/reinforcing function while the mass of densely standing fine carbon fibers of Harada have an insulating function. As there is no recognition of equivalency in the prior art, the Office's reliance on equivalency is improper.

Additionally, there was no clear basis for the Office's assertion that modifying the fiber layer of Weibel to have the mass of densely standing fine carbon fibers of Harada would "inherently provide better sliding quality as well if the fibers were on end." "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." MPEP 2112(IV) (emphasis in original) (quoting *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)). The mass of densely standing fine carbon fibers of Harada, which are not disclosed as having a sliding function, would not necessarily provide better sliding quality than the fibers of Weibel, which are disclosed as a sliding material. *See* Applicants' Specification at ¶ 0031 (explaining that sliding quality depends on fiber type, which varies from very soft and flexible to very hard and rough). Accordingly, contrary to the Office's assertion, the mass of densely standing fine carbon fibers of Harada would not inherently provide better sliding quality.

Also, there was no clear basis for the Office's assertion that modifying the fiber layer of Weibel to have the mass of densely standing fine carbon fibers of Harada would save costs

because the adhesive would prevent premature loss of fibers requiring repair. Nothing in Weibel supports the Office's assertion that the fibers of Weibel are prematurely lost requiring repair of the fiber layer.

For these additional, independent reasons, the rejections over Weibel in view of Harada are improper, and their withdrawal is respectfully requested.

Rejection over Tippins and Hakamada

Tippins and Hakamada, taken alone or in combination, do not disclose a layer of fibers that "are adhesively bonded to the internal surface [**of a tube**] such as to **stand up from the internal surface**," as required by amended claim 1. (emphasis added). Tippins discloses that "an insulating material like rock wool or fiberglass" may be layered on insulating material layer 16b. Tippins at ¶ 0042. It was admitted in the Office Action that Tippins does not disclose that "fibers stand up from the [internal] surface [of insulating material layer 16b]." Office Action at p. 5.

Instead, the Office relies on Hakamada for this feature. *Id.* However, Hakamada does not disclose fibers that stand up from an internal surface either. Hakamada discloses a soft material 3 that "may be provided in the form of fibers or filaments" and may be "a felt consisting of a mass of fibers." Hakamada at col. 2, lines 23-28 and col. 3, lines 3-10. Hakamada discloses that "the soft material 3 may consist of a plurality of longitudinal blocks 3L arranged and spaced from one another circumferentially on the inner surface of the tube 2." *Id.* at col. 3, lines 13-16 and Fig. 5a. But here, it is the soft material 3 that extends from tube 2 in longitudinal blocks 3L. *See Id.* at Fig. 5a. The fibers themselves are not disclosed as standing up from tube 2.

This feature is also not inherent disclosed Hakamada. As noted above, an "allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." MPEP

2112(IV) (emphasis in original). Here, the soft material 3 of Fig. 4 and longitudinal blocks 3L of Fig. 5a are not necessarily formed by fibers standing up from tube 2 because they could instead be formed by fibers that are woven together.

Accordingly, the rejections over Tippins in view of Hakamada are improper because Tippins and Hakamada, taken alone or in combination, do not disclose or suggest fibers that "are adhesively bonded to the internal surface [of a tube] such as to **stand up** from the internal surface," as required by amended claim 1. (emphasis added). Reconsideration and withdrawal of the rejections over Tippins in view of Hakamada are respectfully requested.

Despite this shortcoming of the proposed combination of Tippins and Hakamada, the Office alleged that:

> It would have been obvious to one skilled in the art to modify the fiber layer of Tippins by providing the fibers in such a way that they stand up from the surface as suggested by Hakamada where such is a **known equivalent** way to attach fibers to a base structure for insulative purposes where such would also inherently provide better insulative properties by creating an air space.

Office Action at p. 5 (emphasis added). Here again, the Office's reliance on equivalence is improper.

As noted above, "[i]n order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents." MPEP 2144.06(II) (citing *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958)). Here, there is no recognition of insulating material like rock wool or fiberglass being equivalent with soft material that may be provided in the form of fibers or filaments in the prior art. Instead, the Office's allegation of equivalence is based on the mere fact that the

insulating material of Tippins and soft material of Hakamada both function as insulators and is, therefore, improper.

For the reasons set forth above, the rejections over Tippins in view of Hakamada are improper, and Applicants request withdrawal of the rejections.

Rejection over Tippins and Harada

Tippins and Harada, taken alone or in combination, do not disclose fibers that "are adhesively bonded to the internal surface [**of a tube**] such as to **stand up from the internal surface**," as required by amended claim 1. (emphasis added). As mentioned above, Tippins discloses that "an insulating material like rock wool or fiberglass" may be layered on insulating material layer 16b. Tippins at ¶ 0042. It was admitted in the Office Action that Tippins does not disclose that "fibers stand up from the [internal] surface [of insulating material layer 16b]." Office Action at p. 6. The Office instead relies on Harada for this feature. *Id.* Harada discloses forming "a mass of **densely** standing fine carbon fibers on [a] base material" so that acts as a heat insulator for the base. Harada at Abstract (emphasis added). The Office then alleged that:

> It would have been obvious to one skilled in the art to modify the fiber layer in Tippins by providing the fibers such that they stand up from the surface as suggested by Harada where such is a **known equivalent** way to attach fibers to a base structure for insulative purpose where such would also inherently provide **better** insulative properties by **creating an air space**.

Office Action at p. 6 (emphasis added).

As noted above, "[i]n order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents." MPEP 2144.06(II) (citing *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958)). Here, there is no recognition of insulating material like rock wool or fiberglass

being equivalent with a mass of densely standing fine carbon fibers in the prior art. Instead, the Office's allegation of equivalence is based on the mere fact that the insulating material of Tippins and mass of densely standing fine carbon fibers of Harada both function as insulators and is, therefore, improper.

Also, there is no clear basis for the Office's assertion that modifying the insulating material of Tippins to have the mass of densely standing fine carbon fibers of Harada would "inherently provide better insulative properties by creating an air space." A mass of **densely** standing fine carbon fibers would not necessarily create an air space because the space would be densely filled with carbon fibers.

For the reasons set forth above, the rejections over Tippins in view of Harada are improper. Accordingly, Applicants request that the rejections be withdrawn.

Conclusion

All of the stated grounds of rejection have been sufficiently addressed herein. Applicants therefore respectfully request that the Office reconsider all presently outstanding rejections, and that they be withdrawn. Applicants submit that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

In the event that this paper is not timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02 2135.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants'

undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Date: 3/11/10

RESPECTFULLY SUBMITTED,

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